DRAFT

INITIAL STUDY
MITIGATED NEGATIVE DECLARATION

Armstrong Redwoods State Natural Reserve
Water System Improvements Project

December 2013

State of California
Department of Parks and Recreation

MITIGATED NEGATIVE DECLARATION

PROJECT: **Water System Improvement Project**
Armstrong Redwoods State Natural Reserve

LEAD AGENCY: California Department of Parks and Recreation

AVAILABILITY OF DOCUMENTS: The Initial Study for this Mitigated Negative Declaration is available for review at:

- Russian River District Headquarters
  25381 Steelhead Blvd
  Duncans Mills, California 95430
- Armstrong Redwoods State Natural Reserve
  17000 Armstrong Woods Road
  Guerneville California 95446
- Northern Service Center
  One Capital Mall, Suite 410
  Sacramento, California 95814
- Guerneville Library
  14107 Armstrong Woods Road
  Guerneville, California 95446
- Internet Address: www.parks.ca.gov/CEQA Notices

PROJECT DESCRIPTION:

The Department of Parks and Recreation proposes to replace the existing 4" waterline with an 8" (required by the State Fire Marshall for fire suppression) C900 waterline from the front of the park near the kiosk to the existing 50,000-gallon water tank near the administration building at the back of the Park. Work would use Horizontal Directional Drilling (HDD) as the primary method of installation and would use open trenching at connection points or short distances where HDD would not be practical or cost effective.

A copy of the Initial Study is integrated in to this document. Questions or comments regarding this Initial Study/Mitigated Negative Declaration may be addressed to:

Patricia DuMont
California State Parks
Northern Service Center
One Capitol Mall, Ste. 410
Email: CEQANSC@parks.ca.gov Subject Line: Armstrong Redwoods
Fax: 916-445-8883

Submissions must be in writing and postmarked or received by fax or email no later than January 24, 2014. The originals of any faxed document must be received by regular mail

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Sacramento, California 95814
Email: CEQANSC@parks.ca.gov Subject Line: Armstrong Redwoods
Fax: 916-445-8883

Submissions must be in writing and postmarked or received by fax or email no later than January 24, 2014. The originals of any faxed document must be received by regular mail within ten working days following the deadline for comments, along with proof of successful fax transmission. Email or fax submissions must include full name and address. All comments will be included in the final environmental document for this project and become part of the public record.

1.3 Purpose and Document Organization

The purpose of this document is to evaluate the potential environmental effects of the proposed Water System Improvements Project at Armstrong Redwoods State Natural Reserve. Mitigation measures have been incorporated into the project to eliminate any potentially significant impacts or reduce them to a less-than-significant level.

This document is organized as follows:

- Chapter 1 - Introduction.
  This chapter provides an introduction to the project and describes the purpose and organization of this document.

- Chapter 2 - Project Description.
  This chapter describes the reasons for the project, scope of the project, project objectives and project requirements.

- Chapter 3 - Environmental Setting, Impacts, and Mitigation Measures.
  This chapter identifies the significance of potential environmental impacts, explains the environmental setting for each environmental issue, and evaluates the potential impacts identified in the CEQA Environmental (Initial Study) Checklist. Mitigation measures are incorporated, where appropriate, to reduce potentially significant impacts to a less than significant level.

- Chapter 4 - Mandatory Findings of Significance.
  This chapter identifies and summarizes the overall significance of any potential impacts to natural and cultural resources, cumulative impacts, and impact to humans, as identified in the Initial Study.

- Chapter 5 - Summary of Project Requirements and Mitigation Measures.

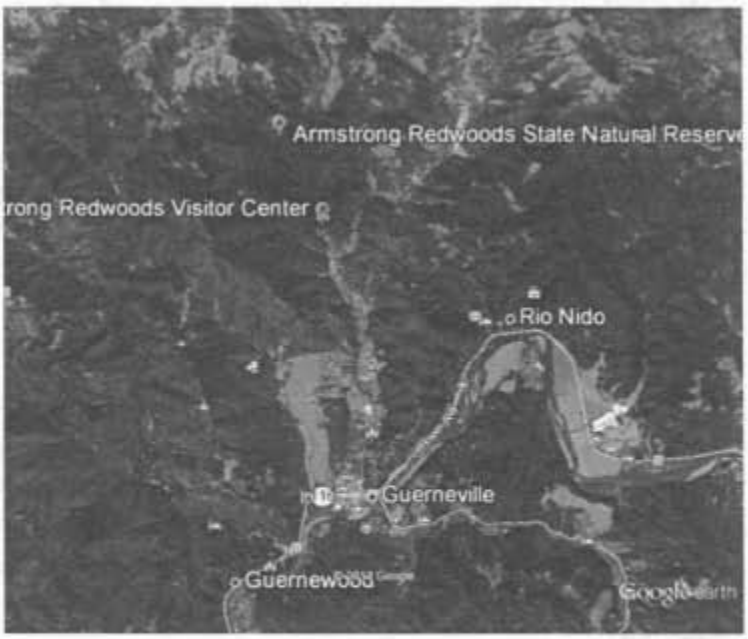
CHAPTER 2
PROJECT DESCRIPTION

2.1 INTRODUCTION

This Initial Study/Mitigated Negative Declaration (IS/ND) has been prepared by the California Department of Parks and Recreation (DPR) to evaluate the potential environmental effects of the proposed Water System Improvements Project at Armstrong Redwoods State Natural Reserve (ARSNR), located north of the City of Guerneville, Sonoma County, California. The proposed project would upgrade and improve the existing water system at the Park to comply with current Health and Safety Codes

2.2 PROJECT LOCATION

The reserve is located three miles north of Guerneville on Armstrong Woods Road (38°32'17"N 123°0'36"W).



Similar to a community park, the local population use ARSNR extensively for hikes, leisurely walks, running and horseback riding. During peak vacation season, visitors use the park for various recreational opportunities.

The waterline project extends from the front of the park near the visitor center to the water tank at the back of the park.

2.3 BACKGROUND AND NEED FOR THE PROJECT

During the 1870s the area was set aside as a natural park and botanical garden by Colonel James Armstrong. After his death, Armstrong's daughter and the Le Baron family mounted an energetic campaign involving public meetings, rallies, and car-caravans to direct public attention to the need to preserve this last remnant of the once mighty redwood forest. Their efforts were successful, and in 1917 the County of Sonoma passed an initiative to purchase the property for $80,000.

Sonoma County operated the grove until 1934. In 1936, when the state of California took over, the grove was opened to the public as Armstrong Redwoods State Park. The grove's status was changed to a natural reserve in 1964 when a greater understanding of its ecological significance prompted a more protective management of the resource.

to the environment in park units. From this list, standard project requirements are assigned, as appropriate to all projects. For example, projects that include ground-disturbing activities, such as trenching; would always include standard project requirements addressing the inadvertent discovery of archaeological artifacts. However, for a project that replaces a roof on an historic structure, ground disturbance would not be necessary; therefore standard project requirements for ground disturbance would not be applicable and would not be assigned to the project.

DPR also makes use of specific project requirements. These are project requirements developed to address project impacts for projects that have unique issues; they would not typically be standardized for projects statewide.

Standard and Specific Project Requirements

Issue	Requirement
Standard Biological 1: Sensitive Natural Communities	• A DPR-approved Environmental Scientist will develop a resource protection plan, in collaboration with project management, that produces the least resource impacts during project implementation • No trees greater than 15 inches in diameter at breast height (dbh) will be removed • All trenching will occur outside of the root health zone (5 times dbh) of any native tree with a dbh of 12 inches or greater unless approved by a DPR-approved Environmental Scientist. • A DPR-approved Environmental Scientist will monitor all trenching and all vegetation removal operations.
Standard Biological 2: Nesting Raptors and Migratory Birds	On-site construction activities will be scheduled during the non-breeding season, September 1-February 28. If on-site construction activities must be scheduled during the bird breeding season, March 1-August 31, a DPR-approved biologist will conduct surveys for nesting bird presence within 7 days prior to the start of on-site construction under the following conditions: • Raptors: If nesting raptors are found, no construction shall occur within a 250 radius of the nest tree between March 1 and August 31, or until the young have fledged and the young would no longer be impacted by project activities,(as determined by the DPR-approved biologist). • Migratory Birds: If active nests are located, no construction shall occur within a 100 foot radius of the nest tree between March 1 and August 31, or until the young have fledged and the young will no longer be impacted by project activities, as determined by the DPR-approved biologist.
Standard Biological 3: Sudden Oak Death	• All project activities and proper that could spread Phytophthora ramorum to new locations will be subject to Best Management Practices (including proper sanitation measures) developed by the California Oak Mortality Task Force and available online at http://www.suddenoakdeath.org/index.html.

Standard Hazard 1 Spill Prevention and Response	• Prior to the start of construction, all equipment will be cleaned before entering the project site. During the project, equipment will be cleaned and repaired (other than emergency repairs) outside the project site boundaries. All contaminated spill residue, or other hazardous compounds will be contained and disposed of outside the boundaries of the site at a lawfully permitted or authorized destination. • Prior to the start of construction, all equipment will be inspected for leaks and regularly inspected thereafter until removed from the project site. • Prior to the start of construction, a Spill Prevention and Response Plan (SPRP) will be prepared to provide protection to on-site workers, the public, and the environment from accidental leaks or spills of vehicle fluids or other potential contaminants. This plan will include but not be limited to the following: ▪ A map that delineates construction staging areas, and where refueling, lubrication, and maintenance of equipment will occur. ▪ A list of items required in an on-site spill kit that will be maintained throughout the life of the project. ▪ Procedures for the proper storage, use, and disposal of any solvents or other chemicals used during the project. ▪ Identification of lawfully permitted or authorized disposal destinations.
Standard Hazard 2: Emergency Response Planning	Prior to the start of construction, DPR and/or its Contractor will prepare an Emergency Response Plan
Standard Hazard 3: Fire Safety	• A Fire Safety Plan will be developed by a DPR approved forester, prior to the start of construction. • Spark arrestors or turbo-charging (which eliminates sparks in exhaust) and fire extinguishers will be required for all heavy equipment. • Construction crews will be required to park vehicles away from flammable material, such as dry grass or brush. At the end of each workday, heavy equipment will be parked over asphalt, or concrete to reduce the chance of fire.
Standard Hydrology 1: Erosion and, Sediment Control / Pollution Prevention Plan	Prior to the start of construction, DPR and/or it Contractor will prepare a Stormwater Soil Loss Pollution Prevention Plan (SWSLPPP) to cover soil loss resulting from storm water run-off and/or wind erosion, sedimentation and/or of dust/particulate matter air pollution during clearing, grading, excavation, stockpiling and reconstruction of existing facilities involving removal and replacement. BMPs include, but are not limited to: construction activity scheduling, erosion and sediment control to protect slopes and drainage courses, mulching or hydroseeding to stabilize disturbed soils, dust control, stockpile management and management of washout areas.

2.8 Visitation to Armstrong Redwoods State Natural Reserve

This project would improve an existing water system; does not increase facitlites and is not expected to increase visitation to ARSNR.

Fiscal Year	Paid Day Use	Free Day Use	**Total**
2000/2001	79,753	472,957	**552,710**
2001/2002	70,460	921,162	**991,622**
2002/2003	66,576	966,406	**1,032,982**
2003/2004	66,643	1,069,454	**1,136,097**
2004/2005	59,325	1,083,962	**1,143,287**
2005/2006	47,599	917,150	**964,749**
2006/2007	50,137	763,274	**813,411**
2007/2008	50,787	774,173	**824,960**
2008/2009	47,936	674,134	**722,070**
2009/2010	40,187	628,381	**668,568**
2010/2011	36,962	568,793	**605,755**
2011/2012	45,056	702,531	**747,587**
2012/2013	49,585	733,660	**783,245**
Total Attendance:	711006	10,276,037	**10987043**
Average Attendance:	54,693	790,464	**845157**

2.9 Consistency with Local Plans and Policies

The project is consistent with the DPR mission and its management directives aimed at preserving the state's extraordinary biological diversity and protecting valued natural and cultural resources. The proposed project is consistent with local plans and policies currently in effect.

2.10 Discretionary Approvals

The project could require approval from California Department of Fish and Wildlife for potential project activities over Fife Creek. Additional internal document reviews include compliance with Public Resources Code § 5024. DPR will acquire all necessary reviews and permits prior to implementing any project components requiring regulatory review.

2.11 Related Projects

DPR often has other smaller maintenance programs, minor restoration, and interpretive projects planned for a park unit. Any projects proposed in areas that have not been previously discussed would occur under a separate CEQA document.

1. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact", as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	☐ Climate Change
☒ None		

DETERMINATION

On the basis of this initial evaluation:

I find that the proposed project **COULD NOT** have a significant effect on the environment and a **NEGATIVE DECLARATION** will be prepared. ☐

I find that, although the original scope of the proposed project **COULD** have had a significant effect on the environment, there **WILL NOT** be a significant effect because revisions/mitigations to the project have been made by or agreed to by the applicant. A **MITIGATED NEGATIVE DECLARATION** will be prepared. ☒

I find that the proposed project **MAY** have a significant effect on the environment and an **ENVIRONMENTAL IMPACT REPORT** or its functional equivalent will be prepared. ☐

I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated impact" on the environment. However, at least one impact has been adequately analyzed in an earlier document, pursuant to applicable legal standards, and has been addressed by mitigation measures based on the earlier analysis, as described in the report's attachments. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the impacts not sufficiently addressed in previous documents. ☐

I find that, although the proposed project could have had a significant effect on the environment, because all potentially significant effects have been adequately analyzed in an earlier EIR or Negative Declaration, pursuant to applicable standards, and have been avoided or mitigated, pursuant to an earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, all impacts have been avoided or mitigated to a less-than-significant level and no further action is required. ☐

12.24.13

Patricia DuMont
Environmental Coordinator

Date

which would adversely affect day or nighttime views in the area?

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Aesthetics is based on criteria **I a – d**, described in the environmental checklist above.

Discussion

a) As described in the Environmental Setting above, the overall site of the proposed project is located in the densely wooded area of Armstrong Redwoods SNR. No designated park scenic vistas that could be temporarily impaired by construction activities and vehicles / equipment are located in the area. Construction activities, such as trenching / directional drilling, would require excavation of soil and removal of a limited amount of vegetation, primarily consisting of small trees/saplings and low-growing plants. These activities would change the close-range scenery at the project sites. Excavated materials would be replaced back into trenches or removed from the site and both of these impacts would be considered temporary and therefore, less than significant.

b) The proposed project site is located entirely within Armstrong Redwoods State Natural Reserve. The closest road, Armstrong Woods Road at the Reserve entrance, is not eligible for listing as a California State Scenic Highway (CalTrans 2012). Dense vegetation at the project site would shield visitors using Armstrong Woods Road from viewing most construction activities, staging/storage of equipment and vehicles by dense vegetation at the project site, short term construction activities, such as directional drilling to install the supply pipe under Armstrong Woods Road and the transportation of equipment and materials to different locations within the overall project area would be visible, but considered temporary and less than significant. The water supply pipe would not be visible from the roadway once installation is complete. Less than significant impact.

c) As described in Discussion (a) above, construction activities would require excavation of soil and removal of a limited amount of vegetation within the project site. As with any construction project, a temporary decrease in the visual appeal of the areas immediately affected by the work being performed would occur; however, work would occur outside of the peak summer visitation season, and construction-related activities would be temporary. In addition, excavated materials would be replaced back into excavation trenches or removed from the site, thus returning the site to pre-construction conditions. No impact.

d) Lighting is not an element of this project, all work will be conducted during daylight hours, and no permanent new light sources will be introduced into the landscape. Any visible above-ground water system equipment is not expected to produce metallic shine or glare. No impact.

Resources Agency, to non-agricultural use?				
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code §4526), or timberland zoned Timberland Production (as defined by government Code § 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

* In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997), prepared by the California Department of Conservation as an optional model for use in assessing impacts on agricultural and farmland.

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Agricultural Resources is based on criteria **II a – e**, described in the environmental checklist above.

Discussion

a - e) **No impact** - All work proposed as part of this project would be confined within park boundaries. Therefore, this project will have no impact on any category of California Farmland, conflict with any existing zoning for agricultural use or Williamson Act contract, or result in the conversion of farmland to non-agricultural use or forest land to non-forest land.

subcategory of the non-attainment designation; an area is designated non-attainment/ transitional to signify that the area is close to attaining the standard for that pollutant.

In contrast to the State area designations, the USEPA makes National area designations for five criteria pollutants: ozone (8 hour standard; the National 1-hour standard was revoked in June 2005), particulate matter (PM), carbon monoxide, nitrogen dioxide, and sulfur dioxide. At the National level: ozone, carbon monoxide, $PM_{2.5}$, and nitrogen dioxide are designated unclassified/attainment; PM_{10} and sulfur dioxide are designated unclassified.

If an area does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant, it is designated as non-attainment. If an area meets the national primary or secondary ambient air quality standard for the pollutant, it is designated in attainment. An area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant is designated unclassifiable (USEPA, 2008).

The following table illustrates the criteria pollutant designations at both the State and federal levels.

Figure Error! No text of specified style in document.**:1 State / Federal Designated Pollutants**

Criteria Pollutant	State	Federal
Ozone	Non-Attainment	Unclassified / Attainment
Suspended Particulates (PM10)	Attainment	Unclassified
Fine Particulates (PM2.5)	Unclassified	Unclassified / Attainment
Carbon Monoxide	Unclassified	Unclassified / Attainment
Nitrogen Dioxide	Attainment	Unclassified / Attainment
Sulfur Dioxide	Attainment	Unclassified
Sulfates	Attainment	No Federal Standard
Lead (particulate)	Attainment	No Federal Standard
Hydrogen Sulfate	Unclassified	No Federal Standard
Visibility reducing particles	Unclassified	No Federal Standard

State designations were updated July 2007; National designations were current as of September 2006

Source: California Air Resources Board

Sources

During personal and business activities, Californians release thousands of tons of pollutants into the air every day. Although each of us may only produce a small amount of air pollution, the combined pollution from the 33 million Californians adds up to problems. Some air pollutants are formed and released during the combustion (burning) of petroleum-based products and other fuels such as wood. Examples include gasoline and diesel-powered vehicles and fireplaces, respectively. Many tons of pollutants also enter the air through

breathing and ingesting it in food, water, soil, or dust. Lead accumulates in the blood, bones, muscles, and fat. Nitrogen dioxide contributes to ozone; causes respiratory problems; contributes to the formation of acid rain; contributes to nutrient overload, which deteriorates water quality; contribute to atmospheric particles causing visibility impairment; reacts to from toxic chemicals; and contributes to global warming (USEPA).

Sensitive Receptors

Sensitive receptors include individuals as well as groups relating to specific land uses. Some individuals are considered to be more "sensitive" than others to air pollutants. The reasons for greater sensitivity than average include health problems, proximity to the emission source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be sensitive receptors to poor air quality because the very young, the old and the infirm are more susceptible to respiratory infections and other air quality related health problems than the general public. Residential uses are considered sensitive receptors because people in residential areas are often at home for extended periods of time, so they can be exposed to pollutants for extended periods. Recreational areas are considered moderately sensitive to poor air quality because vigorous exercise associated with recreation places a high demand on the human respiratory function.

Sensitive receptors in the vicinity of the proposed project area are limited to recreational users. During construction, the project site would not be open to public use.

WOULD THE PROJECT*:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Conflict with or obstruct implementation of the applicable air quality plan or regulation?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations (e.g., children, the elderly, individuals with compromised respiratory or immune systems)?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

* Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make these determinations.

DISCUSSION

e) The Project would not result in the creation of objectionable odors during the construction or post construction period. The Project entails excavation of entrance pits and receiving holes and use of bentonite as a drilling fluid. Objectionable odors will likely be limited only to those associated with diesel emissions. Work will occur during the park's off-season further limiting the objectionable odors on park visitors.

plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered. Also included are habitats that are considered critical for the survival of a listed species or have special value for wildlife species and plant communities that are unique or of limited distribution.

All special-status species and their habitats were evaluated for potential impacts from the proposed Armstrong Redwoods Replace Water System Project. Existing available data were collected and reviewed to determine the proximity of special status plants, animals, and their habitats to the project area. Queries of the California Department of Fish Game's California Natural Diversity Database (DFG 2012), the California Native Plant Society's On-line Inventory, Eighth Edition (CNPS 2010), and the U.S. Fish and Wildlife Service (USFWS 2012) were conducted for special-status species and habitats within the Cazadero and eight surrounding 7½ -minute United States Geological Society (USGS) quadrangle maps(Fort Ross, Tombs Creek, Arched Rock, Duncans Mills, Camp Meeker, Guerneville, Geyserville, and Warm Springs Dam).

Special-status plant and animal species are described below along with their potential to occur within the project area and the impacts this project could cause to these species.

WILDLIFE SPECIES

Wildlife in Armstrong Redwoods Natural Reserve includes common porcupine (*Erethizon dorsatum*), Pacific wren (*Troglodytes pacificus*), Stellar's jay (*Cyanocitta stelleri*) Pacific banana slug (*Ariolimax columbianus*), ensatina (*Ensatina eschscholtzii*), California slender salamander (*Batrachoseps attenuates*) and foothill yellow-legged frog (*Rana boylii*) (iNaturalist.org 2013).

The proposed Water System Repair Project occurs in and around a heavily used public recreation site in an old growth redwood forest setting. The results of a search of the California Natural Diversity Database (CNDDB) for special-status wildlife species that have been documented in ARSNR or could potentially occur in or near the project area are described below.

California Freshwater Shrimp (*Syncaris pacifica*) This federal and state listed endangered species is found in low elevation, low gradient, streams where riparian cover is moderate to heavy (CNDDB 2013). This species prefers shallow pools away from the main stream flow; in winter it prefers undercut banks with exposed roots and in summer near leafy branches touching the water (CNDDB 2013). This species is known to occur in Austin Creek; no records from Fife Creek.

Foothill Yellow-legged Frog (*Rana boylii*). This California Species of Special Concern occurs in clear rivers and creeks with gravel or rock substrate and sunny banks in forest or woodland habitats (Jennings and Hayes 1994). Foothill yellow-legged frogs have been documented in nearby Austin Creek State Recreation Area, and in several Sonoma County

communities by regulatory agencies.

The CDFG classifies the *Sequoia sempervirens* Forest Alliance as a sensitive natural community. This community constitutes the majority of the project area's vegetation.

WETLANDS AND WATERS OF THE UNITED STATES

The federal Clean Water Act (CWA) defines wetlands as lands that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The U.S. Army Corps of Engineers (USACE) has jurisdictional authority of wetlands under provisions found in Section 404 of the CWA. Typically, USACE-jurisdictional wetlands meet three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology.

Waters of the U.S. (aka Other Waters) are regulated by the USACE under Section 404 of the CWA. These are defined as all waters used in interstate or foreign commerce, waters subject to the ebb and flow of the tide, all interstate waters including interstate wetlands and all other waters such as: intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and natural ponds. Based on this definition Fife Creek, which flows through a portion of the project area, constitutes a Water of the U.S.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a sensitive, candidate, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on federally protected wetlands, as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree	☐	☐	☐	☒

vegetation type to a less than significant level.

c) No wetlands will be directly impacted as a result of the proposed project activities. In addition, Best Management Practices (BMP's) and Project Requirements **(Hydro-, Hydro-, Haz-1)** will be incorporated into the project design to avoid indirect impacts from sediments or construction related contaminants entering Fife Creek. No impact.

d) The proposed project would not impede fish passage or wildlife movement. No barriers will be installed and no work will occur in the Fife Creek or any other fish bearing stream. Potential impacts from the proposed project would have no impact on fish passage or wildlife movement. No impact.

e) As stated in the Environmental Setting above, Sonoma County is subject to state and federal quarantine regulations for the pathogen *Phytophthora ramorum*, which causes the often fatal disease known as Sudden Oak Death in numerous species of native plants, especially oaks. Project activities could inadvertently transport this disease to new uninfected locations through pathogen spores in soil or on infected plant material that stick to construction vehicles, equipment, or personnel. Implementation of **Project Specific Requirement Bio-4: Sudden Oak Death** would reduce any potential impacts to a less than significant level.

f) This project does not conflict with any Habitat Conservation Plans, Natural Communities Conservation Plans, or other approved habitat conservation plan. No impact.

surrounding areas. The tree density created a dark and damp environment, not necessarily conducive to habitation or resource procurement and processing.

Historic settlement in Sonoma County began in 1812, west of the project area on the Sonoma Coast, with the establishment of Fort Ross by the Russians. To prevent further Russian settlement inland, the Sonoma Mission (Mission San Francisco de Solano) was founded in 1823. Operational aspects of the California mission system resulted in gathering up indigenous peoples from throughout Northern California, including the Pomo to build the missions as forced Indian labor. Spain's Indian policy during the mission period was a combination of economic, military, political, and religious, motives. Needless to say, missionization of California indigenous people had a negative effect on these gorups including the introduction of devastating disease, homicide, and loss of the native environment and food sources (Cook 1976). Following Mexican independence from Spain in 1821, large ranchos were granted throughout northern California including Sonoma County where 27 land grants were established. During this era, the primary economic mainstay in the area was cattle ranching and timber; this until the Gold Rush in 1849, which brought a large influx of people into the region. This deluge of people created an increased demand for other consumer goods, most notably, dairy products (Salisbury and Roscoe 2012).

Prehistoric and Ethnographic Background

Prehistory

Research related to the prehistory of Sonoma County suggests the project vicinity has been inhabited for at least the last 6,000 years (Fredrickson 1973a, b). During the 1940s and 1950s, with the onset of serious archaeological investigations in the region, researches typically tried to associate the cultural chronologies of Marin and Sonoma Counties into the accepted chronology of the Bay Area (Meighan 1953, Heizer 1947). In later attempts, researches correlated the cultural chronology of the region with that of the North Coast Ranges, which focused primarily on Humboldt and Mendocino Counties (Fredrickson 1973a; 1974). Later, it became obvious from archaeological investigations conducted in region, that the data generated from these studies did not correlate well with either the Bay Area to the south or with the North Coast Ranges. This region instead, represents a transitional zone where two adjacent cultural chronologies merge (Basgall et. al. 2006).

Archaeological sites in the area appear to exhibit affinities to prehistoric cultures to the north in Mendocino County, to the east in Lake County, and to the south in the San Francisco Bay Area. Fredrickson (1973a; 1974) established a cultural sequence for the North Coast that relates only loosely to sites in the region of the project area. This cultural sequence is based on his adaptation of the taxonomic framework for Central California archaeology (Fredrickson 1973b). Originally, this framework was developed by J. Lillard and W. Purves in 1936, and was a three phased sequence grounded on studies throughout the Sacramento Delta region. These phases included "Early," "Intermediate," and "Recent" cultures (Lillard and Purves 1936). The sequence was later refined and developed further by Richard Beardsley in 1948 and 1954 who expand the system include the San Francisco Bay area. Beardsley divided the sequence into Early, Middle, and Late Horizons called the Central California Taxonomic System (CCTS) (Moratto 1984; Beardsley 1948; Lillard, Heizer, and Fenega 1939) and was widely applied to site dating and taxonomy throughout Central California.

points of shouldered lanceolate and contracting-stem forms (Moratto 1984). It is uncertain if manos and milling stones persisted in the Houx Aspect. Basgall et al. (2006) suggest that sites of this era were once considered a rarity in Marin County; however, increasing numbers have been found in recent years along the margins of the North Bay. Sites from this period in Sonoma County are found in valleys, oak woodland habitats, and along the bay shores and other marine settings (Basgall et al. 2006). It is thought this period is associated with an increase in diet breadth and resource intensification as these assemblages display a very broad range of food resources. It is assumed that acorns become an increasingly important component of the diet and appears to correlates with a substantial increase in the number of mortars and pestles found at sites during this period.

Emergent Period (1,100-200 BP) -
During the Emergent Period, the Clear Lake Aspect of the Augustine Pattern begins to appear after A.D. 500. Representative sites found in the Clear Lake Aspect completely lack strong ceremonial orientation and indicate a cultural divergence from sites associated with the Augustine Pattern found in the Central Valley (Moratto 1984). Side-notched and serrated-stemmed projectile points indicative of the Augustine Pattern appear in numerous sites in Sonoma and Lake Counties. In a later phase, diagnostic evidence of clamshell disk and Olivella bead manufacture has been found at several sites around Santa Rosa. This indicates a significant exchange between the inhabitants of the Central Valley and those in Sonoma County.

Typical throughout many areas of California, this period is marked by increasing sedentism, resource intensification, and social complexity and stratification. Overall, population increased during this period which results in closely spaced village sites (Basgall et al. 2006). In Emergent Period sites, artifacts typically include small, often serrated projectile points, triangular projectile points, clamshell disk beads, Olivella beads, incised tubular bird bone artifacts, and various other bone artifacts. Historic era artifacts including trade beads and worked glass begin to appear in the archaeological record as Euro-American settlers start to move into the region (Moratto 1984).

Ethnography

Ethnographic villages are recognized following the Emergent Period. The project area is situated within the territory of the Pomo (the Southwestern or Kashaya Pomo). The Kashaya people are one of seven groups known to speak Pomoan languages and the only group that has a name for them-selves (Kashaya). The name Kashaya was given to the group by a neighboring Pomoan group (Parrish 2001) and means "expert gambler." Spelling variations in the spelling of the name include: Kacia, Kacaya, Kah-chi-ah, Kashaiya, and Ka-shiah (McLeandon and Oswalt 1978).

Traditionally the Kashaya occupied about thirty miles of the Pacific cost in the northwestern portion of Sonoma County. This strip extended from the Gualala River in the north to Duncan's Point a few miles south of the Russian River. From west to east, Kashaya territory stretched from the coastline over four coastal ranges, varying between five and thirty miles inland (Parrish 2001; McLeandon and Oswalt 1979).

Sonoma. The camp referred to as Stumptown, prospered (Wright 1975; Markwyn, 2001). In 1867, George E. Guerne arrived in Stumptown, purchased a suitable flat area of land and started selling land to create a subdivision now known as Guerneville, or Guernewood, Park. Shortly thereafter Guerne erected a sawmill and Stumptown took on the name Guerneville (Wright 1975, DPR 2001). Also in 1867, newcomers Thomas H. Stone and A. C. Laud established claims on 140 and 100 acres, respectively, of valley property 3 miles north of Guerneville. By 1869 Laud would become the sole owner of these 240 acres, which are part of present-day Armstrong Redwoods State Natural Reserve (DPR n.d.).

In 1874, Colonel James Boydston Armstrong moved his family to Sonoma County from Ohio. During the civil War, Armstrong was commissioned a Colonel in the Union Army – a title he would be known by ever after. In partnership with Joseph Estepp, Armstrong purchased 240 acres of land from H.T. Hewitt (DPR n.d.). The following year, Armstrong bought out Estepp's interest in the property and also purchased an adjoining 160 acre parcel (DPR 1975). In 1876 Armstrong added 40 more acres to his holdings. A great portion of this 440 acre holding forms present-day Armstrong Redwoods State Natural Reserve. Armstrong's business ventures included involvement in the Guerneville lumber boom of the 1870's; logging and owning and operating a sawmill site north of Guerneville. Armstrong's mill produced approximately 5 million board feet of lumber per year (DPR 2012).

In 1878, Armstrong gifted 440 acres of land to his daughter, Kate Armstrong. Colonel Armstrong wanted this property (an old growth redwood grove) to be preserved and, eventually, operated as an arboretum. The Colonel tried for many years to ensure the preservation of the grove. In 1891, he attempted to establish an administration with Luther Burbank as the chairman of its first committee. Unfortunately, Armstrong was unable to realize his plan because it required a special act of the State legislature and such support did not exist at the time. Despite this defeat, Armstrong continued to work and plan toward the realization of his dream, the preservation of his beloved grove of redwoods (DPR 2012).

Due to financial and familial pressures, Kate deeded 190 of her 440 acres to her brother, Walter. This parcel was later purchased by Armstrong family friend, Harrison M. LeBaron (DPR 2012). Kate Armstrong died in 1898 and Colonel Armstrong died in 1900. The struggle to preserve the grove was left to Lizzie Armstrong Jones – Armstrong's surviving daughter – and the LeBaron family (DPR 2012). In 1909, a bill for the acquisition of the Grove was passed by both houses of the state legislature, but then Governor Gillete 'pocket vetoed' the bill due to concerns about the State's ability to administer the Grove (DPR n.d.). In 1913, Grove area locals started a county-wide campaign to persuade their county supervisors to purchase the Grove.

In 1917, the continued efforts of Lizzie Armstrong and the LeBarons were rewarded when the County of Sonoma purchased the property for $80,000.00. The Grove was operated by Sonoma County until 1934 when the State took ownership of it as part of the financial arrangement whereby Sonoma Coast State Park was purchased. The grove was opened to the public as Armstrong Redwoods State Park in 1936.

While general public enjoyment of Armstrong Redwoods occurred even during Colonel Armstrong's ownership, large-scale infrastructure development did not begin until the 1930s. Between 1933 and 1939, men from both the WPA and the CCC cleared flatter areas within the park and constructed camp and picnic sites in the park. Additional maintenance, conservation

investigation on September 19 and 20, 2013. The boreholes were located throughout the project area and dug to a depth of either 15 or 30 feet. The monitor inspected each core sample looking for evidence of subsurface archaeological deposits. These samples showed no evidence of subsurface archaeological deposits at any of the borehole locations.

During this investigation, no previously undocumented archaeological resources (pre-contact or historic) were discovered DPR State Park archaeologists in the project area. Features associated with development of the park (WPA and CCC) were noted during the survey and will be addressed by the historian responsible for this review. Additionally, attempts were made to relocate CA-SON-530 but were unsuccessful. The results of this current investigation and those of the past, suggest that significant archaeological deposits will not be impacted by project work; however, given the ambiguity of archaeological sites (often buried in subsurface deposits) project requirements have been developed that will insure the protection of cultural materials discovered inadvertently during project implementation.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Cause a substantial adverse change in the significance of a historical resource, as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource, pursuant to §15064.5?	☐	☐	☐	☒
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

CRITERIA FOR DETERMINING SIGNIFICANCE

Cultural resource specialist use Criteria a-c, described in the environmental checklist above for analyzing the significance of impacts of the Proposed Action to Cultural Resources.

DISCUSSION

a) As discussed in the Environmental Setting, the project site essentially stretches the full length of Armstrong Redwoods SNR. The proposed method for improving the water lines is by means of directional drilling approximately 10 – 30 feet below the surface. Because the work will be carried out this far underground there will be no substantial adverse changes to the significance of any historical resource. No impact
b) As indicated from archival research and past and present field investigations, archaeological deposits appear not to be present in the project area for waterline replacement in Armstrong Redwoods State Park; however, one archaeological site related to prehistoric land use activities is located near the project vicinity. DPR during their field investigations, were unable to locate the site. Other attempts at relocating the site have

XI. GEOLOGY AND SOILS

ENVIRONMENTAL SETTING

Geology

Armstrong Redwoods State Natural Reserve (ARSNR) is situated within the Coast Ranges Geomorphic Province, a series of northwest -trending mountain ranges and valleys that are a result of folding and faulting (California Geological Survey 2002). These ranges and valleys roughly parallel the San Andreas Fault. Mountain top elevations average 2000 to 4000 feet amsl (above mean sea level), with occasional peaks that rise above 6000 feet amsl. Thick Mesozoic and Cenozoic sedimentary strata comprise the bulk of the Coast Ranges. The San Francisco Bay separates the northern and southern Coast Ranges.

Franciscan Complex rocks underlie ARSNR (California Department of Conservation 2012a). The Franciscan is a jumbled, heterogeneous assemblage of rock blocks that represent varied physical characteristics. Specific rock types mapped in the general area of the project include sandstone, metagraywacke, shale, conglomerate, chert, and greenstone. Most of these rocks are Late Jurassic (about 165 million to 146 million years ago) and early Cretaceous (146 million to 100 million years ago) in age.

Topography

The project site generally consists of level to gently sloping terrain in the Fife Creek drainage, which is a narrow stream course hemmed in by steep canyon slopes. Elevations in the project area range from approximately 120 feet amsl near the park entrance kiosk to 200 feet amsl near the park maintenance facilities.

Seismicity

Sonoma County is a seismically active area. The last major earthquakes in Sonoma County were the 5.6 and 5.7 M_W (moment magnitude) earthquakes on the Healdsburg fault in Santa Rosa in 1969 (Wong and Bott 1995). The historically active San Andreas Fault Zone is situated approximately 12 miles to the west of the project area (California Department of Conservation 1994). Displacement on this fault zone has occurred within the last 200 years, including the 7.9 M_W "San Francisco Earthquake" of 1906 (California Department of Conservation 2012b).

The Rodgers Creek and Healdsburg Fault Zones lay approximately 10 miles east of the project area. Holocene fault displacement (during the past 11,700 years) has been identified on the Rodgers Creek Fault. Parts of the Healdsburg Fault Zone exhibit fault displacement during the late Quaternary (past 700,000 years). Pre-Quaternary faults (older than 1.6 million years) or faults without recognized Quaternary displacement are mapped near the project area.

Seismic data analysis indicates that 8.5 and 7.5 M_W earthquakes can be expected for the San Andreas and the Healdsburg-Rodgers Creek faults respectively (Sonoma County 2008). Earthquakes of 8.0 M_W or more can be expected every 50 to 200 years on the San Andreas Fault.

Although potentially susceptible to seismic events, ARSNR does not occur within an Alquist-Priolo Special Studies Zone (California Department of Conservation 2012c). A moderate to

CRITERIA FOR DETERMINING SIGNIFICANCE

The analysis of determining the significance of impacts of the Proposed Action to Geology and Soils is based on criteria VI a – f, described in the environmental checklist above.

DISCUSSION

a) As described in the Environmental Setting above the Project Site is located in a seismically active area and a moderate to strong ground-shaking hazard from a 7.1 MW earthquake is possible for the general project area. While the chance of the rupture of a known earthquake fault, strong seismic ground shaking, or seismic-related ground failure are certainly possible in this area, this project would not substantially increase the exposure of people or structures to risk of loss, injury, or death as a result of these events.

i) The project site is not located within an Alquist-Priolo Earthquake Fault Zone as identified by the California Department of Conservation (2012c). No structures that are designed for human occupancy are located at the project site and are not proposed as part of this project. Therefore, there is no expected adverse effect on people or structures from surface rupture of a known fault due to this project. Integration of Specific Project Requirement Geo-1: Post-Earthquake Inspection (See Chapter 2) would reduce the potential impact of damage to the water system from fault rupture to a less than significant level.

ii) As described in the Environmental Setting above there are three active, or potentially active, faults within twelve miles of the proposed project, including the San Andreas Fault Zone. Earthquakes of 8.5 and 7.5 MW can be expected for the San Andreas and the Healdsburg-Rodgers Creek faults, respectively. Since no structures designed for human occupancy are part of this project there is no expected adverse effect on people or structures from potential future earthquakes. Integration of Specific Project Requirement Geo-1: Post-Earthquake Inspection (See Chapter 2) would reduce the potential impact of damage to the water system from a moderate to strong earthquake to a less than significant level.

iii) Seismic-induced ground failure, such as liquefaction, usually occurs in unconsolidated granular soils that are water saturated. During seismic-induced ground shaking, pore water pressure can increase in loose soils, causing the soils to change from a solid to a liquid state (liquefaction). Some portions of the project are located on alluvial soils that could be susceptible to liquefaction; however as described above no structures designed for human occupancy are part of this project and there is no expected adverse effect on people or structures from liquefaction. Integration of **Specific Project Requirement Geo-1: Post-Earthquake Inspection** (See Chapter 2) would reduce the potential impact of damage to the water system from liquefaction to a less than significant level.

iv) As described in the Environmental Setting above a landslide lies adjacent to a portion of the project; however, since no structures designed for human occupancy are part of this project there is no expected adverse effect on people or structures from potential future landslides. No impact.

VII. GREENHOUSE GAS EMISSIONS

Environmental Setting

Greenhouse gases (GHG) such as carbon dioxide and methane trap heat in the earth's atmosphere. Over time, increased concentrations of these gases produce an increase in the average surface temperature of the earth. The rising temperatures can produce changes in precipitation patterns, storm severity, and sea level, resulting in what is commonly referred to as "climate change."

The California State Legislature proposed and then Governor Schwarzenegger approved laws and policies to reduce the amount of GHG generated each year. As stated in Assembly Bill 32, Global Warming Solutions Act (AB 32), passed in 2006; "The State of California found that Global Warming would have detrimental effects on some of the California's largest industries including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry." AB 32 requires statewide GHG emissions in California be reduced to 1990 levels by the year 2020 and requires the California Air Resources Board (CARB) to adopt rules and regulations to achieve this goal.

Sonoma County has a variety of green initiatives intended to meet the County's GHG reduction goal:

- Participation in the Bay Area Air Quality Management District Best Practices grant program;
- Formation of an internal roadmap to guide green efforts at the Department level, implementation of a County-wide single stream recycling program and implementation of the "Slow Down Sonoma County," a driver outreach and education program that demonstrates the green benefits of safe and prudent vehicle operations;
- A remote computer management and power savings initiative and, finally;
- Pursuit of a Leadership in Energy and Environmental Design (LEED) certification for capital projects with attainment of "Silver" level certification for the Valley of the Moon Children's Home project.

The County of Sonoma has become a leader in climate protection and greenhouse gas (GHG) reduction efforts; the initiatives listed above demonstrate a commitment. Once fully implemented over time, these efforts represent an investment of over $50 million. This investment will yield greenhouse gas reductions and provide substantial savings in power and fuel expenditures to both the county government and county residents.

The California Department of Parks and Recreation (DPR) developed a "Cool Parks" initiative to address climate change within the State Park system. Cool Parks proposes that DPR itself adapt to the environmental changes resulting from climate change. In order to fulfill the Cool Parks initiative, State Parks is dedicated to using alternative energy sources, low emission vehicles, recycling and reusing supplies and materials, and educating staff and visitors on climate change (CDPR 2008).

VIII. HAZARDS AND HAZARDOUS MATERIALS.

ENVIRONMENTAL SETTING

The California Department of Environmental Protection (CALEPA) has the responsibility for compiling (pursuant to Government Code §65962.5) information on hazardous materials sites in California that together are known as the "Cortese" list. A review of this list found that the closest hazardous materials sites to the project area are two sites approximately 10 miles to the southwest near the community of Jenner and the mouth of the Russian River.

The types of materials used and stored at ARSNR that could be hazardous include fluids such as motor vehicle and mechanical equipment fuels, oils, and other lubricants. DPR maintains storage facilities for these fuels and lubricants within the park unit. No storage facilities, or other structures or industrial sites that could contain hazardous materials are located at the sites of the proposed project.

Airports

Six public use airports are located in Sonoma County (Sonoma County 2008). The closest airport is the Charles M. Schulz-Sonoma County Airport approximately 11 miles to the southeast of the project area. The proposed project is not within an airport land use zone/plan or within two miles of a public airport or private airstrip.

Fire Hazards

The California Department of Forestry and Fire Protection (Cal Fire) assesses fire danger throughout California based on methods that estimate fire fuel potential over a 30 to 50-year time horizon, the probability of a burn, and potential vegetation exposure to new construction (Cal Fire 2007). Cal Fire has three severity classifications: moderate, high, and very high. The project area is situated within a high fire severity zone that has been designated as a State Responsibility Area (Cal Fire 2007). Fire protection for the property is available from Cal Fire's Monte Rio station, approximately 5 miles from the project area and the local Russian River Fire Protection District station in Guerneville(FireDepartmentDirectory.com 2012) , approximately 1 mile from the project area. Additionally, ARSNR is outfitted with fire suppression materials.

Schools

The closest school, Guerneville School (K-8), is located approximately two miles south of the project boundary in the community of Guerneville (Sonoma County Office of Education 2012).

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset	☐	☐	☒	☐

b) During the project, hazardous substances could be released to the environment from construction related vehicle or equipment fluid spills or leaks. Integration of Integration of **Standard Project Requirement Hazmat-1: Spill Prevention and Response and Standard Project Requirement Hydro-1: Erosion and Sediment Control and Pollution Prevention** (See Chapter 2) and a Frac-Out Contingency Plan identified in Section a above would reduce the risk to on-site workers, the public, and the environment to a less than significant level.

c) As noted in the Environmental Setting above, there are no schools within one-quarter mile of the project sites. No impact.

d) No part of Armstrong Redwoods State Natural Preserve is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5. No areas within the project sites are currently restricted or known to have hazardous materials present. No impact.

e, f) The project is not located within an airport land use zone/plan, within two miles of a public airport, or in the vicinity of a private air strip. The project would not result in a safety hazard to people residing or working in the area. No impact.

g) In the event of a park emergency where evacuation or emergency response is necessary construction activities could interfere with an emergency response plan or emergency evacuation plan. Integration of **Project Specific Requirement Hazmat-2: Emergency Response Planning** Co would reduce this risk to a less than significant level.

h) The project site is within a forested area which is subject to dry and warm to hot conditions from late spring through autumn. Heavy equipment that could become hot with extended use would be in close proximity to flammable vegetation. Improperly outfitted exhaust systems or friction between metal parts and/or rocks could generate sparks, resulting in a fire. Integration of **Standard Project Requirement Hazmat-3: Wildfire Avoidance and Response** (See Chapter 2) would reduce the potential for adverse impacts from wildfire to a less than significant level.

principal watercourses in Sonoma County are the Petaluma River, Russian River, Sonoma Creek, and their tributaries. Fife Creek, a tributary of the Russian River, runs through Armstrong Redwoods. Characteristic floods of the Russian River basin are normally of short duration, lasting 3 or 4 days. They are the flash-flood type and develop within 24 to 48 hours after the beginning of a flood producing storm and typically recede within 3 days after the end of the storm. Tributaries can rise so rapidly that flooding occurs as early as 4 hours after a heavy rainfall begins. Flood peaks for the Russian river basin generally occur between December and March. The principal flooding problems are caused by inadequate channel capacity to carry off large flows from short duration storms of high intensity and many inadequate bridges and culverts add to the flood problem (FEMA 2008).

Water Quality Regulation

Sonoma County is within the jurisdiction of the North Coast Regional Water Quality Control Board (NCRWQCB), which oversees ten northern California counties. Per the requirements of the Clean Water Act (CWA), and the California Porter-Cologne Act, the NCRWQCB has prepared a Water Quality Control Plan for the watersheds under its jurisdiction. The North Coast Regional Water Quality Control Board Basin Plan (NCRWQCBBP) identifies beneficial uses that exist or have the potential to exist in each water body, establishes water quality objectives for each water body to protect beneficial uses or allow their restoration and provides an implementation program that achieves water quality objectives. Per the requirements of CWA Section 303(c), the NCRWQCBBP is reviewed every three years and revised as necessary to address problems with the plan, and meet new legislative requirements. While Fife Creek is not included in the list of Beneficial Uses of Waters of the North Coast region, nearby Austin Creek is listed. Beneficial uses for Austin Creek include municipal and domestic water supply, agricultural supply, industrial service supply, groundwater recharge, navigation, contact and non-contact recreation, commercial and sport fishing, warm and cold freshwater habitat, wildlife habitat, rare, threatened or endangered species habitat, migration of aquatic organisms, spawning, reproduction and early development. Potential beneficial uses include industrial process supply, hydropower generation and aquaculture (NCRWQCB: Basin Plan Documents; Beneficial uses).

Water Quality

Groundwater quality characteristics and specific local impairments vary with regional setting within the North Coast Hydrologic Region (NCHR). In general, seawater intrusion and nitrates in shallow aquifers are problems in the coastal groundwater basins. From 1994 through 2000, 584 public supply water wells were sampled in 32 of the 63 basins and sub-basins in the NCHR. Analyzed samples indicate that 553 (95%) wells met the state primary Maximum Contaminant Levels (MCL) for drinking water. The remaining 5% of sampled wells had constituents that exceeded one or more MCL (radiological, nitrates, inorganic, volatile and semi-volatile organic compounds). A 1965 report indicated groundwater in Lower Russian River Valley is of the calcium magnesium bicarbonate type and is generally of good quality, with total dissolved solids ranging from 120 to 210 mg/L (DWR).

Macroinvertebrate sampling was performed in Fife Creek in June 1999, whose headwaters are above Armstrong redwoods, at three main locations. A fourth site was tested for dissolved oxygen only. The three main sites were sampled for dissolved oxygen, temperature, pH,

	level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?				
c)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, in a manner which would result in substantial on- or off-site erosion or siltation?	☐	☐	☒	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding?	☐	☐	☐	☒
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f)	Substantially degrade water quality?	☐	☐	☐	☒
g)	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map?	☐	☐	☐	☒
h)	Place structures that would impede or redirect flood flows within a 100-year flood hazard area?	☐	☐	☐	☒
i)	Expose people or structures to a significant risk of loss, injury, or death from flooding, including flooding resulting from the failure of a levee or dam?	☐	☐	☐	☒
j)	Result in inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

DISCUSSION

a) Drilling for the installation of water lines may result in the discharge of "drilling mud", 80% of which is planned to remain in the ground, with approximately 20% being disposed off-site. A minimal potential for impacts to water quality could result from releases of fuels or other fluids from vehicles used in the drilling process. Along with **STANDARD PROJECT REQUIREMENT HAZ** 1, integration of **STANDARD PROJECT REQUIREMENT HYDRO 1 (see Chapter 2)** into construction plans would control releases of pollutants into Fife Creek. Less than significant impact.

b) Drilling below Fife Creek at approximately four locations has the potential to impact groundwater processes. The project is designed to minimize potential impacts to groundwater by drilling up to 15 – 20 feet below the creek bed. Less than significant impact.

c) Existing drainage patterns at the project site would not be affected in a manner that would significantly increase on or off-site erosion or siltation. BMPs for erosion will be integrated

X. LAND USE AND PLANNING

Environmental Setting

Sonoma County consists of approximately 1,025,000 acres (1,500 square miles). State and federal agencies, including the U.S. Bureau of Land Management (BLM), and DPR, are responsible for managing over 120,000 acres, encompassing approximately 12 percent of the total area within the County (EPS 2003).

Sonoma County directly administrates land use and planning policies within its boundaries with the exception of State, federal and tribal lands. The County divides itself into nine areas for planning purposes defined as Planning Areas/City Urban Service Areas (USA). ARSNP is located in the Russian River Planning Area. The majority of the planning area is designated for long-term natural open space and resource protection.

No Habitat Conservation Plans (HCPs) protecting specific plant and animal species have been adopted for SPSP or FRSHP.

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with the applicable land use plan, policy, or regulation of any agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion

a) The proposed project would not divide an established community because none exist within the boundaries of ARSNP; therefore, there would be no impact.

b) All proposed work would occur within the boundaries of ARSNP. The proposed Project is consistent with local plans and policies including the County of Sonoma General Plan. Although ARSNP does not have a General Plan, work to repair, replace or rehabilitate existing facilities or to protect public health and safety are permitted under PRC § 5002.2(c). No impact.

c) No Habitat Conservation Plans (HCPs) protecting specific plant and animal species have been adopted for ARSNP. No impact.

XII. NOISE.

ENVIRONMENTAL SETTING

Sound is any detectable fluctuation in air pressure and generally is measured on a logarithmic scale in decibels (dB). When unwanted sound (i.e., noise) is measured, an electronic filter is used to de-emphasize extreme high and low frequencies to which human hearing has decreased sensitivity. Resulting noise measurements are expressed in weighting frequencies called A-weighted decibels (dBA). While zero dBA is the low threshold of human hearing, a sustained noise equal or greater than 90 dBA is painful and can cause hearing loss (Table XI-1, Bearden 2000).

Table NE-1: Examples of A- Weighted Sound Levels Relative Loudness

Sound	Sound Level (dbA)	Relative Loudness (approximate)	Relative Sound Energy
Jet aircraft, 100 feet	130	128	10000000
Rock music with amplifier	120	64	1000000
Thunder, snowmobile (operator)	110	32	100000
Boiler shop, power mower	100	16	10000
Orchestral crescendo at 25 feet, noisy	90	8	1000
Busy Street	80	4	100
Interior of department store	70	2	10
Ordinary conversation, 3 feet away	60	1	1
Quiet automobile at low speed	50	½	0.1
Average office	40	¼	0.01
City residence	30	1/8	0.001
Quiet country residence	20	1/16	0.0001
Rustle of leaves	10	1/32	0.00001
Threshold of hearing	0	1/64	0

(Sonoma County 2008)

Noise is further described according to how it varies over time and whether the source of noise is moving or stationary. Background noise in a particular location gradually varies over the course of a 24-hour period with the addition and elimination of individual sounds. Several terms are used to describe noise and its effects. The equivalent sound level (L_{eq}) describes the average noise exposure level for a specific location during a specific time period, typically over the course of one hour. The Community Noise Equivalent Level (CNEL) is a twenty-four hour average of L_{eq} with an additional 5 dBA penalty for noise generated between the hours of 7:00 p.m. and 10:00 p.m. and a 10 dBA penalty during the hours of 10:00 p.m. and 7:00 a.m. The penalties account for how much more pronounced a noise is at night when other sounds have diminished. Federal, state, and local governments have defined noise and established

levels without the project)?				
d) Create a substantial temporary or periodic increase in ambient noise levels in the vicinity of the project, in excess of noise levels existing without the project?	☐	☐	☒	☐
e) Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport? If so, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐
f) Be in the vicinity of a private airstrip? If so, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

CRITERIA FOR DETERMINING SIGNIFICANCE

The analysis of determining the significance of impacts of the Proposed Action to Noise is based on criteria **XI a – f**, described in the environmental checklist above.

DISCUSSION

a) Trucks and heavy equipment such as a backhoe and directional drill would operate during materials delivery and construction activities associated with the proposed project. Project-related noise levels in and adjacent to proposed drill pit sites would fluctuate, depending on the type and number of vehicles and equipment in use at any given time.

Visitors and local residents driving past the project sites on Armstrong Woods Road could hear noises related to construction activities until they pass the sites. Depending on the specific project-related activities being performed, short-term increases in ambient noise levels could result in speech interference near the project sites and could annoy park visitors and local residents. Under these circumstances, park visitors and local residents could recreate in other portions of Armstrong Redwoods SNR, Austin Creek SRA or seek out other nearby parks and recreation facilities.

Generally, project-related work would not occur during on weekends or holidays when visitation is higher than during the week. Weekend work could be implemented, but only to accelerate the proposed project or address emergency or unforeseen circumstances. Noise associated with the proposed project is considered to have a potentially significant short-term impact to nearby noise-sensitive receptors. Integration of **STANDARD PROJECT REQUIREMENT NOISE-1, NOISE EXPOSURE** (See Chapter 2) for nose exposure would reduce potential impacts of the project to a less than significant level.

c) Project-related activities would not involve the use of explosives, pile driving, or other intensive construction techniques that could generate significant ground vibration or noise. Minor vibration adjacent to mechanized equipment, such as the directional drill, during construction work would be generated only on a short term basis. Therefore, ground-borne vibrations and noises would have a less than significant impact.

XIV. POPULATION AND HOUSING

Environmental Setting

Sonoma County had a population of 484,470 in 2008. Between 2000 and 2008, the County's population grew at a rate of 0.5% (Sonoma County Permit and Resource Management Department (PRMD), 2009). ARSNP, located in the Russian River Planning Area is one of the more sparsely populated of the nine planning regions in the County. In 2000, the 16,400 residents of this region lived primarily in Forestville, Mirabel and Guerneville; outside these small communities, the population is limited.

The community of Guerneville is located just outside the park's southern boundary. Adjacent properties are ranchlands, and open space to the east.

Housing within the park boundaries is limited to an employee cabin near the park entrance and one located past the picnic area towards Bull Frog Pond. ARSNP is an area managed for the purpose of preserving native ecological associations in a condition of undisturbed integrity. The development of permanent housing is inconsistent with that objective and not a planned use of the park.

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

a) The project proposes to replace an existing above-ground water line with one placed entirely underground with no increase in capacity. It does not propose any elements that would induce population growth in the area. No impacts.

b) No housing would be moved or removed for the project. No impact.

c) No persons would be displaced either temporarily or permanently. No impact.

Schools

The closest school, Guerneville School (K-8), is located approximately two miles south of the project sites in the town of Guerneville (Google Maps 2012, Sonoma County Office of Education 2012). No schools exist within the project site.

Parks and Other Public Facilities

Many parks and recreational facilities that serve local residents and visitors are located throughout Sonoma County. The Russian River Recreation & Park District oversees smaller recreations facilities such as playgrounds and beach areas in the town of Guerneville. The Highlands Resort is a private overnight facility located in Guerneville a little over two miles south of Armstrong Redwoods SNR. The closest large hospital to the park is Kaiser Foundation, approximately 21 miles southeast of the project site, in Santa Rosa,

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Result in significant environmental impacts from construction associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

CRITERIA FOR DETERMINING SIGNIFICANCE

The analysis for determining the significance of impacts of the Proposed Action to Public Services is based on criteria **XIII a**, described in the environmental checklist above.

DISCUSSION

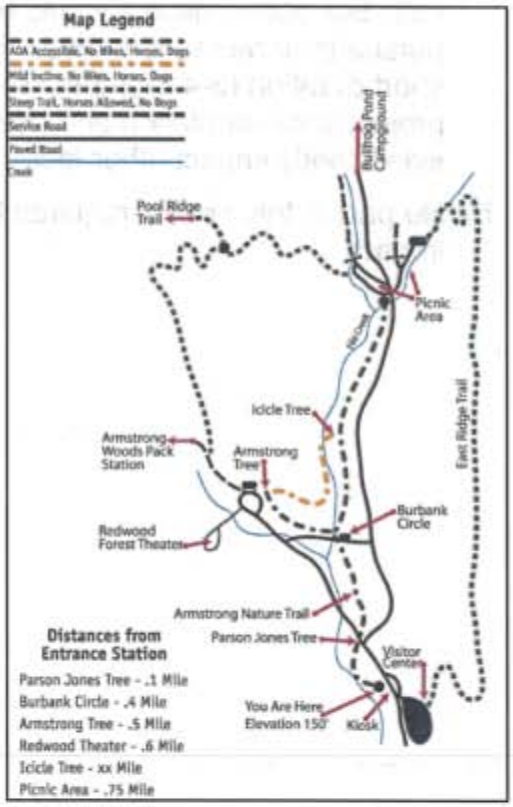
This proposed project would repair the water system that serves the Armstrong Redwoods Day Use areas within Armstrong Redwoods SNR.

a) Fire Protection: No components of the proposed Armstrong Redwoods Water System Improvements Project would contribute to an increase of visitation and the level of required public services is expected to remain relatively static; however, use of construction equipment in the vicinity of flammable vegetation at the project sites could present an increased risk of fire that could result in additional demands on CalFire and/or local fire

XV. RECREATION.

ENVIRONMENTAL SETTING

Sonoma County Parks include more than 150 miles of trails leading to beaches, mountains, forests, meadows and lakes. From Petaluma to The Sea Ranch and Sonoma to Bodega Bay: hike, camp, host a picnic, ride a bike, paddle a kayak, or take in the view



Armstrong Redwoods SNR, located approximately one mile north of Guerneville, is one of the last virgin growth Coastal Redwood groves in this coastal area.

The reserve includes a visitor center, outdoor amphitheater, self-guided nature trails, and a variety of picnic facilities. The picnic area is 3/4 of a mile from the park entrance; grills, tables and restrooms are situated beneath the tall trees while seasonal creeks meander throughout the park during the winter months. All trails are closed to equestrian use through the winter season. However, when conditions permit, the trails are opened, usually during the peak season in summer.

Although no camping is available in the redwood grove, there is a campground at Austin Creek State Recreation Area, which is adjacent to the park. Austin Creek is accessed through the same entrance as Armstrong Redwoods and its rolling hills, open grasslands, conifers, and oaks are a contrast to the dense canopy of the redwood grove.

	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
WOULD THE PROJECT:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

CRITERIA FOR DETERMINING SIGNIFICANCE

The analysis of determining the significance of impacts of the Proposed Action to Recreation is based on criteria **XV a – b**, described in the environmental checklist above.

XVI. TRANSPORTATION/TRAFFIC.

ENVIRONMENTAL SETTING

The proposed project is located in ARSNR, in the Guerneville area of Sonoma County. This region does not have an extensive highway network due to its remote location in the county and relatively low population density. The major roads and highways in the vicinity of the site are State Highway 116 and River Road. River Road connects the community of Windsor on State Highway 101 and Guerneville. State Highway 116 connects the town of Petaluma with the community of Jenner on the Sonoma Coast, and passes through Guerneville.

Access to ARSNR is provided by Armstrong Redwoods Road, a county-maintained road that also provides access to several private residences and undeveloped privately-owned parcels beyond the park boundaries.

The performance of the county roads and highways is evaluated based on LOS definitions. Six levels of service represent varying roadway conditions ranging from ideal (LOS "A") to forced flow (LOS "F").

Level Of Service (LOS)	Description of Typical Traffic Conditions	Delay	Service Rating
A	Highest quality of service. Free traffic flow, low volumes and densities. Little or no restriction on maneuverability or speed, and a high level or comfort and convenience.	None	Excellent
B	Stable traffic flow – speed becoming slightly restricted; the presence of others in the traffic stream begins to be noticeable. Low resistance on maneuverability.	None	Very Good
C	Stable traffic flow, but less freedom to select speed, change lanes or pass. Comfort and convenience decreasing as density increases.	Minimal	Good
D	Approaching unstable flow. Speeds tolerable, but subject to sudden and considerable variation. Reduced maneuverability, driver comfort and convenience.	Minimal	Adequate
E	Unstable traffic flow with rapidly fluctuating speeds and flow rates. Short headways, low maneuverability and low driver comfort and convenience.	Significant	Fair
F	Forced traffic flow. Speed and flow may drop to zero with high densities. Queues tend to form behind such locations since arrival flow exceed traffic discharges.	Considerable	Poor

Road. The LOS on this county road is considered "Highest quality of service. Free traffic flow, low volumes and densities. Little or no restriction on maneuverability or speed, and a high level or comfort and convenience" or Level A. In addition, this increase would be temporary and not expected to significantly increase traffic on the road, violating level of service standards on a County road. Less than significant impact.

c) The project would not affect air traffic patterns. No impact.

d) The project would not contain any features or introduce incompatible uses that would increase hazards. No impact.

e) Construction of the project could result in temporary closures to portions of roads: however construction crews would have the ability to cover any open trenches to provide access to roads during emergency situations. In addition, DPR Rangers would need access to patrol the Reserve for safety purposes; therefore, small sections would continue to be available. Less than significant.

f) During the construction process, parking spaces could be used for staging equipment and by construction personnel, thereby reducing the number of available spaces for park visitors; however, project implementation is temporary and of short duration (3-4 months). Therefore, considered a less than significant impact.

g) No part of the project would conflict with adopted policies, plans, or policies regarding public transit. No impact.

Criteria for Determining Significance

The analysis of determining the significance of impacts of the Proposed Action to Utilities and Service Systems is based on criteria **XVII a – g**, described in the environmental checklist above.

Discussion

a) The proposed project would improve an existing deteriorated water system; the project does not have a wastewater treatment component. No impact.

b-c) The proposed project does not include water, wastewater treatment nor new storm drainage facilities. No impact.

d) The proposed project improves a deteriorating water system. While the Reserve currently has ample water supplies to provide high-quality recreational opportunities, improvement of the deteriorating system could provide additional water as leaking waterlines are replaced. No new or expanded entitlements are needed, No impacts.

e) The Reserve disposes of wastewater via a leachfield system. However, as previously, stated, the proposed project has no wastewater component. No impact.

f-g) As proposed, the project will comply with federal, state, and local statutes and regulations as they relate to solid waste. No impact.

fulfillment of these project requirements would render project impacts on cultural resources less than significant.

c) DPR often has smaller maintenance programs and rehabilitation projects planned for a park unit. A water availability study is planned scheduled within the next few months; no other projects, other than routine maintenance, are planned for the proposed project area in the foreseeable future. Additionally, impacts from other environmental issues addressed in this evaluation do not overlap in such a way as to result in cumulative impacts that are greater than the sum of the parts. Less than significant impact.

d) Most project activities would have no potentially significant effects on humans. However, environmental impacts on air quality (e.g., heavy equipment emissions), ambient noise levels (e.g., heavy equipment operation), could have substantially adverse effects on humans. While this project could have substantially adverse, direct or indirect effects on humans, implementation of this project according to designed safety standards, engineering specifications, park closure and warning notices and other prescribed safety precautions, project monitoring, and measures outlined in Standard and Specific Project Requirements would ensure potential impacts from emissions remain at a less than-significant level.

CHAPTER 6
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APPENDIX A

MAPS, TABLES, AND CHARTS

APPENDIX B

PROJECT DESIGN GRAPHICS